

REMARKS

Claims 19-45 are pending rejected in this application. Claims 19, 20 and 45 are amended hereby.

Responsive to the rejection of claims 19-45 under 35 U.S.C. §112, second paragraph, Applicants have amended claims 19 and 45 to indicate that there is no further machinery is utilized for homogenizing the fibrous stock. Only the machinery mentioned in the claim is utilized for the step of refining the fibrous stock, which includes a disperger according to the other limitations mentioned in the claim. Applicants submit that amending the claim does particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

In recognition of the provisional rejections of double patenting, Applicants take no action at the present time and are awaiting resolution of the balance of the items cited by the Examiner due to an Office Action.

Responsive to the rejections of claims 19, 21-30, 38-40 and 45 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,223,090 (Klungness et al) and U.S. Patent No. 4,943,349 (Gomez), Applicants have amended independent claims 19 and 45 and submit that claims 19, 21-30, 38-40 and 45 are now in condition for allowance.

Klungness et al. disclose a method of fiber loading a chemical compound. Calcium oxide (lime) or calcium hydroxide is mixed with dewatered crumb pulp having the desired level of moisture. The calcium oxide can be added to the water used for reconstituting dried fibers prior to adding the water to the fibers. Upon adding the calcium oxide to a dewatered crumb pulp and simple mixing for a period of a few minutes, the calcium oxide combines with the water to form calcium hydroxide within the mass of fibers in the pulp (column 6, lines 8-17). The calcium oxide or calcium hydroxide may be added at any desired level up to about 50%, based on the weight of the dry cellulosic material. The lower limit for addition of the calcium oxide may be as

slow as desired, but is preferably not less than about 0.1%. Most preferably, the calcium oxide or calcium hydroxide is present at a level of from about 10% to about 40%, on a per weight basis. Carbon dioxide is added at a level sufficient to cause complete reaction of the chemical with the gas to form calcium carbonate (column 6, lines 38-48). In the case of paper pulp, the paper pulp can be immediately transferred to a papermaking operation where it is formed into a slurry, refined and placed onto a Fourdrinier machine or other suitable papermaking apparatus (column 6, lines 56-59). The precipitation of calcium carbonate in cellulosic fibers containing from about 40% to about 85% moisture (15% to 60% of fiber) and loaded with from about 10% to about 40% of calcium oxide or calcium hydroxide is easily effected in a pressurized container with low shear mixing. The carbon dioxide pressure in the container is preferably from about 5 psig to about 60 psig, and the low shear mixing is preferably continued for a period of from about 1 minute to about 60 minutes. It has also been determined that for fibers containing from about 95% to about 85% moisture (5% to 15% of fiber) and the same calcium oxide loading, that high shear treatment during contact with the carbon dioxide is required to cause complete precipitation of calcium carbonate. Prior to forcing the pulp into contact with the rotating plate, the carbon dioxide is pumped into the sealed hopper to pressurize the hopper with carbon dioxide and it remains in contact with the pulp while the paper pulp is stirred in the hopper and while the pulp is being transported by the auger through the refiner disk (column 6, line 64 through column 7, line 41). A simple way to provide contact of the carbon dioxide with the paper pulp under high shear treatment is by use of a pressurized refiner. The refiner is a cylindrical hopper into which the paper pulp is loaded. The cylindrical hopper is gas tight and can be pressurized with a gas. A rotating shaft containing beater arms is disposed within the hopper to keep the paper pulp from matting. An auger screw is located beneath the hopper for conveying the paper pulp into the interior space between a set of matched discs. The discs shred the pulp crumbs as the pulp passes

therebetween. Prior to forcing the pulp into contact with the rotating one of the matched discs, the carbon dioxide is pumped into the sealed hopper to pressurize the hopper, the carbon dioxide remaining in contact with the pulp while the paper pulp is stirred in the hopper and while the pulp is being transported by the auger through the refiner discs (column 7, lines 16-41). In a typical refiner run procedure the pulp, calcium reactant and water are first mixed in a steel bowl using a Hobart mixer. The high consistency pulp is then loaded into a hopper of a refiner which is closed and sealed. Therein the pulp is then refined in a carbon dioxide atmosphere (column 8, lines 17-51).

Gomez discloses a process for comparing the sheet material with improved on-machine retention including a preparation of a mineral filament dispersed in an aqueous phase in a vat that is then mixed with an organic binder by agitation using a static mixer of conic or cylindrical offset propeller type or a dynamic mixer. The mineral filler with organic binder in aqueous suspension is then introduced continuously into the pulp from the first stage before or after the pump has been cleaned (column 5, lines 8-43).

In contrast, claim 19 as amended recites in part:

not utilizing any further machinery for homogenizing the fibrous stock suspension.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Klungness et al. or any of the other cited references, alone or in combination and has distinct advantages thereover.

Klungness et al. disclose a method of fiber loading a chemical compound; the method uses separate machinery for the homogenizing of the fiber suspension. As indicated in the paragraph that bridges pages 10 and 11 of Applicants' specification, there is no further machinery utilized for homogenizing the fibrous stock suspension, such as a screw press, nor is there a conditioning machine for homogenizing the fibrous suspension, such as an equalizing

reactor. This provides a considerably simpler arrangement of stock preparation as compared to the prior art. The Examiner has indicated that Klungness et al. teaches the mixing of calcium oxide pulp and that the mixture is then sent to the refiner with no intervening steps. This admission that the pulp is mixed with the calcium oxide along with the further recitation of Klungness, together indicate that mixing and stirring operations, which are homogenizing operations, occur apart from the refining step, contrary to the method of the present invention. The present invention, only homogenizes the mixture in the refining step with the only mentioned machinery, a disperger. Therefore, Klungness et al. and any of the other cited references, alone or in combination fail to disclose, teach or suggest the step of not utilizing any further machinery for homogenizing the fibrous stock suspension, as recited in claim 19.

An advantage of the present invention is that the method of loading the fibrous stock suspension is considerably simplified by not utilizing additional machinery for homogenizing the fibrous stock suspension, as is done in the prior art. This reduces cost and energy expenditures since the running of separate machinery is precluded by the present invention. For the foregoing reasons, Applicants submit that claim 19, and claims 21-30 and 38-40 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

In further contrast, claim 45 as amended recites in part:

the apparatus not including any further machinery for homogenizing the fibrous stock suspension.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Klungness et al. or any of the other cited references, alone or in combination and has distinct advantages thereover.

Klungness et al. disclose a method of fiber loading a chemical compound; the method uses separate machinery for the homogenizing of the fiber suspension. As indicated in

the paragraph that bridges pages 10 and 11 of Applicants' specification, there is no additional machinery utilized for homogenizing the fibrous stock suspension, such as a screw press, nor is there a conditioning machine for homogenizing the fibrous suspension, such as an equalizing reactor. This provides a considerably simpler arrangement of stock preparation as compared to the prior art. The Examiner has indicated that Klungness et al. teaches the mixing of calcium oxide pulp and that the mixture is then sent to the refiner with no intervening steps. This admission that the pulp is mixed with the calcium oxide along with the further recitation of Klungness, together indicate that mixing and stirring operations, which are homogenizing operations, occur apart from the disperger and refiner, contrary to the method of the present invention. The present invention, only homogenizes the mixture in the disperger or refiner. Therefore, Klungness et al. and any of the other cited references, alone or in combination fail to disclose, teach or suggest the apparatus not including any machinery for homogenizing the fibrous stock suspension, as recited in claim 45.

An advantage of the present invention is that the method of loading the fibrous stock suspension is considerably simplified by not utilizing machinery for homogenizing the fibrous stock suspension, as is done in the prior art. This reduces cost and energy expenditures since the running of separate machinery is precluded by the present invention. For the foregoing reasons, Applicants submit that claim 45 is now in condition for allowance, which is hereby respectfully requested.

Claim 20 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Klungness et al. in view of Gomez. However, claim 20 depends from claim 19, which is now in condition for allowance for the reasons given above. Accordingly, Applicants submit that claim 20 is now in condition for allowance, which is hereby respectfully requested.

Claims 43 and 44 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Klungness et al. in view of Gomez, and in further view of U.S. Patent No. 3,794,558 (Back). However, claims 43 and 44 depend from claim 19, and claim 19 is now in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 43 and 44 are now in condition for allowance, which is hereby respectfully requested.

Claims 33-37, 41 and 42 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Klungness et al., Gomez and in further view of U.S. Patent Application Publication No. 2003/0010463 (Doelle). However, claims 33-37, 41 and 42 depend from claim 19, which is now in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 33-37, 41 and 42 are now in condition for allowance, which is hereby respectfully requested.

Claims 31 and 32 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Klungness et al. in view of U.S. Patent Publication No. 2002/0092636 (Rheims et al.) and a Handbook for Pulp and Paper Technologists by Smook. However, claims 31 and 32 depend from claim 19, and claim 19 is now in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 31 and 32 are now in condition for allowance, which is hereby respectfully requested.

For the foregoing reasons, Applicants submit that the pending claims are definite and do particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Moreover, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorizes that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,

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